

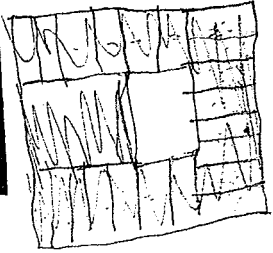
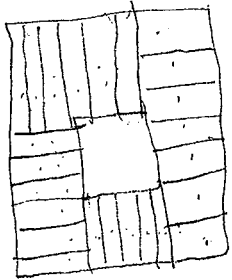
The following are the
4 samples to be used
at Kempenfelt during
Breakout #7 (every
group gets the SAME
4 samples to look at
through different
lenses)

Sample #1

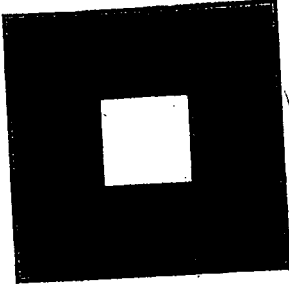
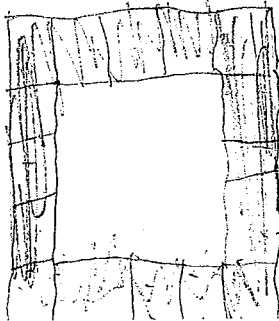
Dimension	Shaded
3×3	8
5×5	16
7×7	24
9×9	32

(2a) Perimeter Problem

7×7



5×5



This is a 3×3 grid of squares with only the outside edge shaded.

If you had a 5×5 grid of squares where only the outside edge of squares is shaded, how many squares would be shaded?

If you had a 7×7 grid of squares with only the outside edge of squares shaded, how many squares would be shaded?

If you had a grid of 100 squares, how many would be shaded?

What is the rule? How do you know? Can you explain your rule? Can you give evidence?

You take the Dimensions and -1×4

So $3 \times 3 - 1 = 8 \times 4 = 8$ shaded squares

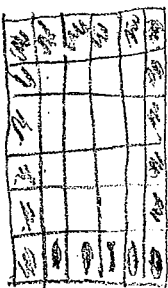
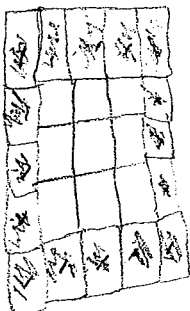
$5 \times 5 - 1 = 4 \times 4 = 16$ shaded squares

$100 - 1 = 99 \times 4$

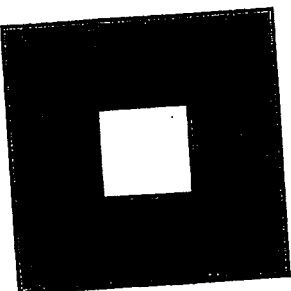
$= 396$ Shaded Squares $(5n-1) \times 4$

$3 \times 3 = 9$
 $9 \times 4 = 36$
 $36 - 1 = 35$

Sample #2



(2a) Perimeter Problem



This is a 3x3 grid of squares with only the outside edge shaded.

If you had a 5x5 grid of squares where only the outside edge of squares is shaded, how many squares would be shaded?

If you had a 17x17 grid of squares with only the outside edge of squares shaded, how many squares would be shaded?

If you had a grid of 100 squares, how many would be shaded?

What is the rule? How do you know? Can you explain your rule? Can you give evidence?

This says

$$25 = x$$

If you had 100 squares, there would be 25 shaded.

Shaded

If I had a 5x5 grid 16 squares would be

$$y = 4x$$

$$100 = 4x$$

$$x = 25$$

$$y = 4x$$

$$y = 4(25)$$

$$y = 100$$

there would be 100 squares shaded for a 17x17 square

blank by blank shaded squares

0	1	2	3	4
0	1	2	3	4
0	1	2	3	4
0	1	2	3	4
0	1	2	3	4

$$x^2 - (x-2)^2$$

Sample #3

- 1) let x = the amount of squares by squares you want

$$x^2 - (x-2)^2 = 5^2 - (5-2)^2$$

$$= 25 - (3)^2$$

\therefore there will be 16 outer squares

$$= 25 - 9$$

$$= 16$$

- 2) let x = the amount of squares by squares you want

$$x^2 - (x-2)^2 = 17^2 - (17-2)^2$$

$$= 289 - (15)^2$$

$$= 289 - 225$$

$$= 64$$

- \therefore there will be 64 outer squares
- 3) let x = the amount of squares by squares you want

$$x^2 - (x-2)^2 = 100^2 - (100-2)^2$$

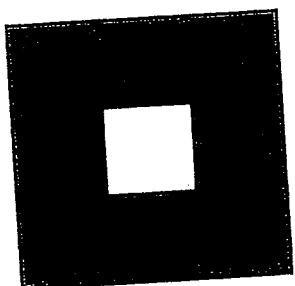
$$= 10000 - (98)^2$$

$$= 10000 - 9604$$

$$= 396$$

\therefore there will be 396 squares

(2a) Perimeter Problem



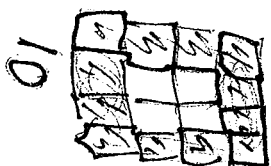
This is a 3x3 grid of squares with only the outside edge shaded.

- 1) if you had a 5x5 grid of squares where only the outside edge of squares is shaded, how many squares would be shaded?
- 2) if you had a 17x17 grid of squares with only the outside edge of squares shaded, how many squares would be shaded?
- 3) if you had a grid of 100 squares, how many would be shaded?
- 4) What is the rule? How do you know? Can you explain your rule? Can you give evidence?

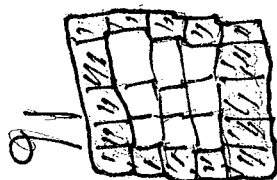
4) the rule is $x^2 - (x-2)^2$.

over

4x4



5x5



Sample #4

(2a) Perimeter Problem

So 3x3 has 8

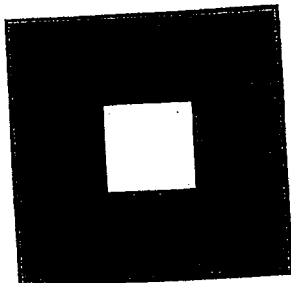
3x3

$$d(2) + (d-2)2$$

$$= 3(2) + (3-2)2$$

$$= 6 + 2$$

$$= 8$$



6x6

$$7 \times 7 = 28$$

This is a 3x3 grid of squares with only the outside edge shaded.

If you had a 5x5 grid of squares where only the outside edge of squares is shaded, how many squares would be shaded?

If you had a 17x17 grid of squares with only the outside edge of squares shaded, how many squares would be shaded?

If you had a grid of 100 squares, how many would be shaded?

What is the rule? How do you know? Can you explain your rule? Can you give evidence?

works!

The general rule I found is $d(2) + (d-2)2$

where d is the dimension of one side

dimensions	outside edges
1x1	1
2x2	4
3x3	8
4x4	12
5x5	16
6x6	20
7x7	24
8x8	28

$$\text{dimension}(2) + (\text{dimension}-2)2$$